

ONTARIO DEPARTMENT OF AGRICULTURE.

DOES IT PAY TO SPRAY?

During the summers of 1895 and of 1896, practical instruction in spraying was given at various places in the Province under the direction of the Ontario Department of Agriculture. This work was continued during the past year. The method adopted was as follows: Mr. W. M. Orr, of Fruitland, Ont., a successful fruit-grower of wide experience was appointed as superintendent of the work. He selected twenty-nine orchards in various parts of the Province that were suitable for the work and convenient for visitors. Each orchard was provided with a cheap spraying outfit. Three men with experience in spraying were selected to visit these orchards, ten for each man, and do the spraying at certain fixed dates. Notice of the dates was sent to all persons interested, through the mail and by means of the local press. The spraying was done in the presence of the neighboring farmers, and all information given as was required. The sprayers repeated the work until seven successive applications had been made. The total appropriation for this work has been \$1,800 each year. An illustrated bulletin giving full information was also widely distributed.

The following is the list of owners of orchards sprayed in 1897:

St. Thomas	Ernest Luton.	Caledonia.....	W. Richardson.
Bothwell	A. C. Sussex.	Dunnville	John Taylor.
Wallaceburg.....	J. W. Steinhoff.	Niagara Falls South..	Thomas Smith.
Sarnia	Jehu Davis.	St. Catharines.....	A. Pay.
Lucan	W. E. Hooper.	Smithville	George Adams.
Kincardine.....	Norman McPherson.	Clarkson's	C. G. Davis.
Wingham.....	G. Moffat.	Oshawa	R. T. Macaie.
Arthur	Wm. Cahalan.	Port Hope.....	E. M. Mitchell.
Orangeville	D. McPheeter.	Brighton	John Nisbett.
Milton.....	R. E. Harrison.	Trenton.....	W. A. Warner.
Stoney Creek.....	Robert Grainger.	Consecon.....	Joseph L. Adams.
Lynden	B. Vansickle.	Pictou	J. P. Thorn.
Burford	W. H. Lewis.	Prescott	George Bowyer.
Tilsonburg	James Haney.	South Lancaster.....	Alex. Cameron.
Port Dover	George Dixon.		

With a view to finding out what the owners of the orchards thought of the results of the spraying, and in order to come to a conclusion as to the advisability

of continuing the instruction in 1898, the following letter was sent to every one of the twenty-nine persons in the above list.

ONTARIO DEPARTMENT OF AGRICULTURE.

DEAR SIR:—The Minister has now under consideration the question of continuing the work of giving practical instruction in spraying during the coming year. If this is to be carried on it will be necessary to recommend the making of a grant by the Legislature at its coming session. Hence arises the necessity for coming to a decision at once.

With a view of arriving at a proper decision the Minister would be much pleased to receive from you a statement as to your opinion of the value of the spraying in your orchard during the past season. Anything that you can send in this connection will be acceptable. If you can make a definite statement as to the actual results per tree, so much the better.

Awaiting an early reply, I remain

Yours very truly,

C. C. JAMES,

Deputy Minister of Agriculture.

The following are the replies from the gentlemen addressed, in the order given above. They are worth reading carefully. They are not the opinion of this Department. They are not the opinion of Mr. Orr—his report will appear later. They are the opinions of the owners of the orchards written by themselves. These letters speak for themselves.

Mr. E. E. Luton, St. Thomas: "In reply to yours of the 3rd, I may say that I consider spraying a most decided success financially. The spraying in my orchard, as conducted by W. M. Orr, superintendent of the experimental spraying, was very instructive, and in some cases very great interest was taken by those in the neighborhood that had orchards to spray. The applications were to have been seven times, but owing to the trees being in blossom only six were made, beginning on April the 20th, and finishing on July 8th. Although the first part of the season was wet and unfavorable the results were good. The varieties sprayed were: Ben Davis, Northern Spy, Greening, Talman Sweet, Fall Pippin, Seeks, Blenheim Pippin, Russet, and pears. The result on pears was not satisfactory, but on apples was a most decided success, but was more noticable on Greenings and Spys. Out of the orchard, which only has 93 trees, and 11 of them sweet, I sold 60 bbls. and reserved 10 for my own use, and yet have about 25 bbls. of second-class, or culls. My apples, for quality, were unsurpassed in this section, taking 6 firsts and 5 second prizes out of 13 entries at the Fall Fair. I received \$2.50 per bbl., which was 15 cents above any others in this section—the majority selling at from \$1.50 to \$1.85 per bbl.

"In regard to profit per tree, may say that I cannot at present give definite information, but think I am quite safe in stating fully twice as much money was obtained from the sprayed trees as from the unsprayed. On the latter the apples were scabby and about the size of walnuts, while the foliage turned brown and fell off fully five weeks in advance of sprayed, and this year's spraying may have a very great benefit on next year's produce.

"Apples in this section were such a poor crop that people in passing the orchard were quite often heard to say that spraying must pay, as the sprayed orchard was the only one with any apples in that they had seen in all their day's drive. Many walked through the orchard and compared the sprayed with the unsprayed."

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Mr. A. C. Sussex, Bothwell: "In answer to your letter of the 3rd inst., asking my opinion with reference to spraying done in my orchard this year, would say it was a perfect success. I think I will be safe in stating that the fruit on the trees sprayed would average 75 per cent. first-class, while the trees left unsprayed would not average more than 5 per cent., and the fruit on the latter not being more than half the size. I would certainly recommend the Government to continue the spraying, and also increase the number of places for the experiment, as it is hard to get the farmers to come any distance to see the work done, it being new to the most of them. In my opinion we will be compelled to spray all fruit trees in the future or go out of the business altogether."

Capt. J. W. Steinhoff, Wallaceburg: "Replying to your favor of the 3rd, regarding the value of spraying, I beg to inform you that I think it a good thing. The result of what I did being this: I had one row of apple trees sprayed, and found the yield of fruit on that row about 80 per cent. greater than the yield of the row alongside of it that was not sprayed, besides being free from grubs."

Mr. Jehu Davis, Sarnia: "Your letter of the 3rd inst. duly received, and I would say that I consider the work of spraying the trees in my orchard satisfactory. With the almost utter failure of the apple crop in this district this year it was not possible to tell what the results would have been, but I am quite satisfied with the test, and hope it will be carried on next season. It is not possible for me to give any details as to the value of the spray or the actual results per tree, but on examining the fruit on the different trees, those which were sprayed and those which were not sprayed alongside, a marked difference in the quality of the fruit was quite apparent."

Mr. W. E. Hooper, Lucan: "In reply to yours of the 3rd inst. re fruit tree spraying, it affords me pleasure to express my entire satisfaction regarding the results upon my orchard. My crop was far above the average in this locality. The fruit was by far the best quality I ever raised and was perfectly free from worms, etc. We applied the solution to small fruit as well as the fruit trees. I made one application to my gooseberries, which was productive of the best results. In my orchard I have two peach trees, one only of which I sprayed, and upon that I had an abundant supply of fine peaches, while upon the other the crop was next to nothing. Anything I could do by way of encouraging the continuation of this work would be gladly done."

Mr. Norman McPherson, Kincardine: "The spraying of the apples was of great benefit, so much so that I intend to continue it myself. The fruit is larger and better formed and the Snow apples are almost free from spots. Had the weather been better the results might have been still more satisfactory. As to the trees sprayed, I could perhaps illustrate the cash benefit to me. The Snow apple trees that were sprayed have realized in fruit this year \$4.00 each; those not sprayed—nothing—as the fruit was hardly worth picking. All the other varieties sprayed were greatly improved, but not to the same extent as the Snow apples. The Northern Spys, for instance, were fully fifty per cent. better through the spraying. A large number of fruit growers in this section are now in favor of spraying, and the visit of the officers sent out by the Department has been the means of conferring a great benefit upon all owners of orchards."

Mr. J. J. Moffat, Wingham: "In reply to yours of Nov. 3rd on continuing the work of spraying: It really is a great benefit to the fruit. We are greatly pleased with the work done in our orchard this last summer. We have kept the spraying barrel, and intend carrying on the work."

The apples averaged about as follows, out of one hundred in each case :

	Sprayed.	Unsprayed.
Snow	90	10
Mann	80	40
Maiden's Blush.....	100	50
Colvert	100	50
Spy	80	10
Blenheim Orange.....	85	25
Talman Sweet.....	75	25

Mr. Wm. H. Cahalan, Arthur: "You requested of me to give you a statement of the spraying in our orchard. It was of great value to my orchard this year. I am well pleased with the result. I have bought the spraying pump from Mr. Orr. I will give you a statement of the different kinds of fruit to the best of my opinion:

Fruit that was sprayed (clean and good fruit):

	Per cent.
Snow Apples.....	95
Northern Spy.....	98
Russets.....	98

Fruit not sprayed with scabs on :

	Per cent.
Snow Apples.....	90
Northern Spy.....	85
Russets.....	70

This is as good results as I can give you. Hoping this will be satisfactory to you."

Mr. R. E. Harrison, Milton:—"I think the practical instruction in spraying is very beneficial and should be continued. In my orchard the spraying for the scab or spot on the apple was a complete success, as the fruit on the sprayed trees was perfectly clean, while that of the unsprayed was not. The apples were not free from worms as we would like to see them. The spraying was not so successful for this as I had expected, but this may have been partly owing to rain which followed the early spraying, and which to a certain extent washed off the mixture."

Mr. Robt. Grainger, Stoncy Creek: "I received your letter concerning the spraying of apple trees. I think it a very good thing. I have eight acres of orchard, between three and four hundred trees. There was not a large crop of apples around here this year. They sprayed twenty trees and I had more apples off those twenty trees than on all the others put together. Mr. W. Orr sprayed one Snow apple tree and there was a very great difference. They were nice and bright, and no scab on them. The ones that were not sprayed were all knots and scabs."

Mr. B. Vansickle, Lynden: "Yours of the 22nd inst. to hand. In reply will say that from the spraying of a part of my orchard there is a great difference of the sprayed and unsprayed, especially Snow apples; I put the difference at 80 per cent. The Spy apples, about 50 per cent. better than the unsprayed. I think they were not sprayed soon enough, for the fungus had appeared before the last spraying. The Golden Pippin had a good show of blossom but had no fruit; was sprayed. The Cabeshea apple had a good show of blossom and no fruit; was sprayed. The Rambo apple had a good show of blossom and no fruit; was sprayed. I believe in the spraying of all fruit trees, and to have good sound fruit it will be necessary to continue the spraying."

Mr. W. H. Lewis, Burford: "Your communication of Nov. 3rd in regard to spraying to hand, and would say in reply that I am much pleased with the results of spraying in our orchard this year. In the first place the foliage was much nicer, and

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many made the remark that the foliage was such a bright glossy green. Secondly, the fruit was a much better sample both in size and freeness from spots. The trees the government sprayed seven times were about 80 per cent. free from spots; those right beside them not sprayed about 4 per cent. free from spots, and not so good in size. The rest of the orchard we sprayed twice. First, just before they came in bloom; the next time just after the apples were formed. These were about 40 or 50 per cent. free from spots. The apple packers who have been packing six or seven weeks say that they have only packed in three orchards that have been sprayed, and that the fruit in these orchards are the best that they have had. I am well satisfied with the spraying and will follow it up after this. We have 175 barrels, and I am satisfied that it was \$100 benefit to me this year. The people took very little interest in the spraying during the spraying season; now they are enquiring about it."

Mr. J. S. Haney, Tilsburg: "Yours of Nov. 3rd, re spraying, received. In my orchard, of about 400 trees, there was very little blossom, except the Spys. They were very well loaded with apples, but of a very poor quality, hardly worth the picking. There are some twenty-five Spy trees, three of which were sprayed, and judging from the result of the three trees had the whole twenty-five been sprayed I would have had 100 barrels of good shipping apples, whereas from the whole orchard I had nineteen barrels packed, fourteen of which were off the twenty trees that were sprayed. Three Spys were well loaded, and a couple of Baldwins fairly well loaded, and the remainder of the twenty trees sprayed had a few scattering apples all of a good quality. The twenty trees that were sprayed would average eighty-five per cent. of perfect apples, while the unsprayed trees were not fit for anything but cider apples. Therefore it is plain to see that spraying is very beneficial, and will give good results if properly sprayed."

Mr. George Dixon, Port Dover: "Yours received in regard to spraying of orchard. Trees that were sprayed in my orchard showed seventy per cent. good apples, while those that were not sprayed showed only ten per cent. I am satisfied that spraying is a good thing."

Mr. William Richardson, Colodonia: "In reply to yours of Nov. 3rd, in reference to spraying. Work done in my orchard was a decided success. Actual results with sprayed and unsprayed trees were as follows:

	Sprayed.	Unsprayed.
Northern Spy	92 per cent. good.	8 per cent. good
Baldwins	95 " "	worthless.
Snow	70 " "	20 per cent. good.
Greenings	80 " "	10 " "
Harvest Apples	60 " "	worthless.

Many farmers were prejudiced against spraying. Actual results with the evidence of the apples on the trees after spraying was convincing to all who saw them."

Mr. John Taylor, Dunnville: "I reply to your enquiry of the 3rd inst., I beg to say that the government sprayer sprayed some of the trees in my orchard this summer, and although only a poor crop compared with other years, yet, I must state that the apples on the trees sprayed were far more numerous than on those not treated and of a size and quality far superior to any I ever had before. On the majority of the apples produced from the sprayed trees there were no blemishes whatever, and even the flavor surpassed in excellence that of any of the others grown on the unsprayed trees, which were spotted and of very inferior quality.

"Spraying the trees is certainly the only way to obtain apples perfect in shape, delicious in flavor, unblemished in spots, and an abundant yield."

Mr. Albert Pay, St. Catharines: "Your favor of Nov. 3rd duly received. In reply would say that I do not consider spraying an experiment any longer. The results from spraying the last two years in my orchard have given very satisfactory results, especially this year. On account of so much rain at the time the spraying was done, it is all the more pleasing to note the beneficial results. Some of the sprayed trees, especially Northern Spy and Greenings, had a full crop, fully eighty to eighty-five per cent. of which were perfect, while the unsprayed trees did not have half a crop, and which would not have been over 40 per cent. of clean fruit. I would very much like to see the spraying continued on the same trees another year. I am fully convinced that to grow paying crops of fruit we must spray thoroughly. I had very satisfactory results from spraying my pears and plums also. The fruit from this section for the past number of years has not been of so good a quality as I would like, but from the experience I have through your Department during the past two seasons, I am fully convinced we can by thorough spraying produce as good apples as any section of Ontario. Quite a number of our fruit growers have visited my orchard and compared the fruit as it was on the trees, and all were fully convinced of the benefit of spraying. To more fully show the benefits of spraying I placed a basket of sprayed and one of unsprayed in a leading fruit dealer's store in our city, which was more convincing than talking. Mr. Orr, your Superintendent, and his assistant, Mr. McNeilly, were very painstaking in having the work done thoroughly, and also in explaining how the Bordeaux mixture was made, and the proper time for putting it on, to any of the growers who were there on the day the spraying was done, which was a great benefit to a good many. To allow you to personally see some of the samples, I will send by express a basket of some of the sprayed and unsprayed, each variety named, it will hardly be necessary to say which was sprayed. If I can give you any further information I will be pleased to do so."

Mr. George Adams, Smithville: "In reply to your letter about the value of spraying, I have eleven Spy trees. Eight of them were sprayed, and the result was 24 barrels of the finest fruit I ever picked from them; I sold them for \$2.50 per barrel; and four barrels of culls at \$1.00 per barrel—28 in all. These culls were not spotted, but were under size and wormy. The three Spy trees not sprayed gave three barrels of badly spotted fruit which sold for \$2 per barrel, and about ten bushels of culls which I sold for \$1.25 for the lot. There were six other trees sprayed; Snows, Roxbury Russet, Newtown Pippin, Canada Red, and Ben Davis, which had from one to three barrels of nice clean fruit per tree. Other trees of the same variety had none worth picking on them. The trees were sprayed seven times. Five times the spraying was followed by rain within one to six hours. My trees were never sprayed before. My snow apples have been spotted for the last twelve or fourteen years."

Mr. C. G. Davis, Freeman: "Yours of Nov. 3rd to hand. I think spraying is valuable when carried on properly. This was a very bad year for a test, so much wet in first part of season—latter part so dry. We cannot give you a definite statement of the actual increase of apples of better quality where the spraying was done, as I live at Burlington and this farm is 20 miles away. I forgot to tell the men to pick the apples sprayed by Mr. Orr, and keep them separate. Since receiving, I asked Mr. Mackay, the man in charge of farm his opinion. He thought there was fully one-third more of Spys, and of better quality on the trees sprayed six times. The other part of the orchard we sprayed ourselves, only twice, and on the trees left by Mr. Orr, as not sprayed at all, the fruit was quite inferior. I would suggest that labels be got out for the trees sprayed three times, six times, and not at all, to be nailed to each tree so that there would be no doubt as to how the trees were treated. We neglected to get a plan from Mr. Orr, and probably in that way the thing was overlooked. I am very sorry that we cannot give you something more definite, but I think spraying, no doubt, is a great help for procuring good fruit."

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Mr. R. J. Mackie, Oshawa : "As a result of the spraying in my orchard I found that where the spraying was done nearly all the apples were packed and of No. 1 quality; and where it was not done only about half the apples were packed, and many of these were spotted. I have purchased the spray pump, and intend using it on all my orchard next year. It would have been worth \$200 to me this year if I had done so. I would recommend carrying on the work."

Mr. E. M. Mitchell, Port Hope : "In replying to your circular of the 3rd, regarding the spraying experiments, I am unable to make a definite statement as to the effect on each tree, but taken by sorts it seems to be about as follows. The sprayed Early Harvests contained about 50 per cent. of good fruit, that is, A 1 fruit, while the unsprayed fruit had not more than 20 per cent. of good fruit, that is, A 1 fruit, while the about 90 per cent. clean, good apples, while those not sprayed had scarcely any absolutely clean, and not more than 60 per cent. that would be called merchantable. Snow apples, for some reason or other, showed no benefit whatever from the spraying; in fact, the sprayed tree was worse spotted than the one unsprayed. The above statements refer more particularly to the effects of the spraying on the scab, to which all apples in this section were very subject this season. As to the effect of spraying on the Codling worm, the difference, if any, between the sprayed and the unsprayed was very slight. We were totally free from this pest here this season. Had it been more prevalent perhaps the benefits of spraying would have been more marked. As most of the damage is done by the second brood of the Codling Moth, which is hatched after spraying time, it would seem there needs to be a modification of the system to be effectual. Persistent spraying, year after year, by thinning out the first brood, would no doubt reduce the number of moths. As to Bud Moth and the Cigar Case-bearer, we have not much experience with them yet, so cannot say as to the effect spraying would have on them."

Mr. John Nesbitt, Brighton : "Your telegram this morning received. I would have replied sooner, but have been away and have just got home. I found the spraying very beneficial, but cannot give average as they were picked before Mr. Orr got here. I noticed it more particularly on the Snows, as the tree of Snows, which was sprayed, was large and nearly clean of spots, while the others were small and spotted very much, and I found it very much the same on my Autumn Strawberries, but there was not so much difference. I find that fruit growers will have to spray if they want to raise good, sound fruit."

Mr. W. A. Warner, Trenton : "Replying to your favor of the 3rd inst., I beg to state that I am more than satisfied with the result of spraying at my orchard last spring. The packers say that the fruit obtained from my trees which were sprayed this year was the finest they had packed, especially the Spys, Snows, Wealthys and Baldwins. I am satisfied that spraying is a first-class thing, and would like to see it done in this section again next year. I intend to spray everything in my orchard next year. I have 2,500 trees. I am satisfied if I had sprayed my whole orchard this year I would have obtained \$500 more than I did."

Mr. Joseph L. Adams, Consecow : "In answer to your letter I think I can truly say the sprayed apples were fully 70 or 75 per cent. better than the unsprayed, and I also think it was beneficial to the trees."

Mr. Geo. Bowyer, Prescott : "My orchard has never been sprayed before. The fruit on the sprayed trees is larger and the foliage is much better than on the unsprayed trees. Not much scab in the orchard except on Snows. By actual count 96 per cent. of sprayed Snows and all of the others showed scab. I would recommend spraying. I intend to spray my orchard after this. My apples were the only clean apples in our section."

Mr. Alexander Cameron, South Lancaster: "In answer to your practical questions in reference to spraying of my orchard, I have much pleasure in saying that the effect of spraying done this season was marvellous. The fruit on the trees sprayed I sold at \$3 and \$4 per barrel, and those of the same variety not sprayed were worthless. In fact, I do not think it should be fed to stock, as I consider the fruit is full of disease."

As a statement had not been received from Mr. J. P. Thorn, of Picton, at the time of printing this bulletin, it is thought desirable to give the following statement furnished by Mr. Orr, which was certified to by Mr. Thorn as giving the results in the latter's orchard at Picton.

Percentage of Clean Fruit.

	Sprayed.	Unsprayed.
Spy	90	10
Colvert	90	..
St. Lawrence	75	10
Snow	75	25
Golden Russet	90	25
Belleflower	75	10
Swaar	75	10
Astrachan	80	15

Mr. Thorn states that the twenty-nine trees sprayed realized \$75 more in fruit because of the spraying, and that sprayed Spys are worth \$3.50 per bbl. to-day (October 15th) and that the best from the unsprayed trees will not bring more than \$2.00 per bbl.